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St. Croix Cooperative Bont Tick Program

Environmental Assessment September 2001

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I. Need for the Proposal

Ticks are known to be the vectors of diseases (viral, protozoal, helminthic, and bacterial) of animals (see figure 1 for examples) and humans. Exotic ticks of the genus *Amblyomma* are known to be capable of carrying and transmitting the rickettsial bacterium *Cowdria ruminantium* that causes African heartwater disease. This includes the tropical bont tick, *Amblyomma variegatum*. African heartwater disease is an acute disease of domestic and wild ruminants, including cattle, sheep, goats, deer, and antelope. Heartwater is only found in sub-Saharan countries in Africa and on three islands in the Caribbean Sea. Mortality rates in susceptible species are estimated to range from 40% to 100%. No treatment or vaccine is available for the disease, and control of the disease is achieved primarily through vector control.

Ticks that are the potential vectors of the disease may already be present in the environment of the United States and in territories (e.g., the Gulf coast tick, distributed throughout the Gulf States in the United States, has been experimentally shown to be a good vector of the disease), or the tropical bont tick may inadvertently enter the United States on animals including migratory birds or packing material. Spread of the tropical bont tick across islands in the Caribbean and Gulf of Mexico has been monitored for several years. As has been associated with other tick infestations (see figure 2), this movement has been accompanied by increased incidence of disease and considerable loss of livestock production.

The bont tick was first detected on St. Croix from inspection of a bull in August 2000. Despite considerable effort to delimit the extent of infestation, no additional detections occurred that year. However, surveillance in 2001 revealed a moderate tick infestation on some livestock present on the premises of a nearby abandoned golf course. Although the present infestation poses risks limited to livestock on the golf course, the potential threat to health of other livestock and wildlife on the island from spread of the bont tick infestation poses substantial risk of disease and lost animal production and trade.

In response to the potential risk from this infestation, the Animal and Plant Health Inspection Service (APHIS) in cooperation with other Federal and territorial agencies is considering a site-specific program to minimize the health threat. APHIS is proposing a cooperative program in response to the disease threat that includes quarantine, regulating animal importations,

controlling exotic tick vectors on premises, and treating infested animals using pesticides with proven efficacy.

Figure 1. Exotic ticks that are known or suspected vectors of economically significant foreign animal diseases.

Amblyomma

A. astrion
A. cohaerens
A. gemma
A. hebraeum
A. lepidum
A. marmoreum
A. pomposum
A. sparsum
A. testudinarium
A. tholloni

Boophilus

B. annulatus
B. decoloratus
B. forae
B. geigyi
B. kohlsi
B. microplus

Dermacentor

D. daghestanicus
D. marginatus
D. nuttalli
D. pictus
D. reticulatus
D. silvarium

Haemaphysalis

H. bispinosa
H. leachii
H. longicornis
H. otophila
H. punctata
H. sulcata

Hyalomma

H. anatolicum anatolicum
H. a. excavatum
H. detritum
H. dromedarii
H. marginatum marginatum
H. m. rufipes
H. m. turanicum
H. scupense
H. truncatum

Ixodes

I. persulcatus
I. pilosus
I. ricinus

Ornithodorus

O. erraticus
O. moubata
O. moubata porcinus

Rhipicephalus

R. appendiculatus
R. bursa
R. capensis
R. compositus
R. everstsi evertsi
R. e. mimeticus
R. glabroscutatum
R. koch
R. lunulatus
R. pulchellus
R. simus
R. turanicus
R. zambeziensis

Figure 2. Exotic ticks that either cause paralysis or toxicosis, transmit livestock diseases of limited economic importance, or commonly infest livestock in their native range.

Amblyomma

A. integra

Argas

A. miniatus
A. vulgaris
A. walkerae

Dermacentor

D. auratus
D. marginatus
D. pavlovskyi

Haemaphysalis

H. acciculifer
H. anomala
H. concinna
H. heinrichi
H. intermedia
H. inermis
H. kutchensis
H. montgomeryi
H. nadchatrami
H. otophila
H. parmata
H. punctata
H. shimoga
H. sulcata
H. tilagea

Hyalomma

H. arabica
H. albiparmatum
H. asiaticum asiaticum
H. dromedarii

Ixodes

I. crenulatus
I. holocyclus
I. rubicundus

Margaropus

M. winthemi

Nosoma

N. monstrosum

Ornithodorus

O. lahorensis
O. savignyi

Rhipicephalus

R. humeralus
R. hurti
R. maculatus
R. praetextatus
R. pravus
R. sulcatus
R. tricuspis (=lunulatus)

APHIS has authority under 21 United States Code (U.S.C.) 111, 113, 115, 117, 120, 121, 123-126, 134b, and Code of Federal Regulations (CFR) 2.22, 2.80, and 371.2d to carry out operations or measures to detect, eradicate, suppress, control, and prevent or retard the spread of certain vectors of animal disease. APHIS' authorities apply specifically to the control of animal diseases; however, some animal diseases are zoonoses (animal disease that are also transmissible to humans), and their control would also be beneficial to the preservation of human health as well. This

environmental assessment (EA) is prepared in compliance with the provisions of the National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. 4321 *et seq.*, and its implementing regulations. It is intended to apply specifically to the emergency actions to eradicate the tropical bont tick infestation on the island of St.Croix in the U.S. Virgin Islands.

II. Alternatives

Four alternatives were considered for the proposed St. Croix Cooperative Bont Tick Eradication Program: no action, quarantine only, quarantine and control, and quarantine and eradication. Each is described briefly in this section, and the environmental consequences of each are summarized in the following section.

A. No Action

The no action alternative would be characterized by no APHIS action to control or limit the spread of the bont tick. Efforts to control ticks could proceed through the efforts of territorial and local governments, or commercial establishments, or private individuals, but the lack of Federal involvement could seriously jeopardize the success of such efforts. The lack of coordinated control efforts could result in expanding infestations of disease-bearing ticks and subsequent disease in domestic and wild animal populations. Diseased animals might be offered in interstate commerce and could lead to disease outbreaks in other territories and States, with the potential for substantial damage to agricultural resources and economy.

B. Quarantine Only

The quarantine only alternative would be characterized by APHIS' cooperation in a program that would only seek to exclude ticks, or prevent their spread to other areas. Exterior quarantines could be imposed on other countries to prevent or regulate the importation of animals that are capable of carrying exotic ticks. If suitable surveillance methods were employed to identify exotic tick infestations, cooperative Federal/territorial quarantines could be implemented that would limit the spread of the infestation through commerce or human-assisted transportation. APHIS cooperation in a speculative quarantine only alternative would not preclude the efforts of territorial or local governments, or commercial establishments, or private

individuals to control tick infestations by whatever means might be available to them. APHIS' cooperation in a quarantine only alternative, however, would not be consistent with APHIS' statutory responsibilities and authorities for eradicating or controlling foreign animal diseases including outbreaks.

C. Quarantine and Control

The quarantine and control alternative would involve APHIS' cooperation in a program to exclude, detect, delimit, prevent the spread of, and control of the tropical bont tick. The program would continue an exterior quarantine that prohibits importation of exotic ticks and regulates the importation of host animal species. Some animals would continue to be prohibited from importation. Other animal species (e.g., reptiles, amphibians, llamas, antelope, and captive wild species) would require inspection and certification. The program would include surveys to detect if exotic ticks are present in premises that house imported animals, such as zoos or animal dealerships, and to delimit populations, if found. The program would also include the means for emergency control of exotic ticks on animals and premises where animals are kept or found.

D. Quarantine and Eradication (Preferred Alternative)

The quarantine and eradication alternative would involve APHIS' cooperation in a comprehensive program to exclude, detect, delimit, prevent the spread of, and eradicate tropical bont tick infestations. This alternative is similar to the previous alternative, in that regulatory and control methods would be the same. However, the goal of eradication of the bont tick from the island of St. Croix under this alternative involves a more intensive effort than would be undertaken for a control and quarantine alternative. This alternative would eliminate pest risk and set a program goal of eradication over a finite time as compared to an ongoing effort under a quarantine and control alternative. The proposed program continues an exterior quarantine that prohibits importation of exotic ticks and regulates the importation of host animal species. Some animals will be prohibited from importation. Other animal species (e.g., reptiles, amphibians, llamas, antelope, and captive wild species) will require inspection and certification. The program includes continuing surveys to detect if exotic ticks are present in premises that house imported animals, such as zoos or animal dealerships, and to delimit populations, if found. The program would also

provide the means for emergency control of exotic ticks on animals and premises where animals are kept or found.

III. Environmental Consequences

The environmental consequences associated with the St. Croix Cooperative Bont Tick Program relate primarily to the disease and pest impact of the ticks and to the control measures used to treat infested hosts and premises. Each of the four alternatives considered in this assessment poses some risk of adverse environmental consequences to human health, livestock, wildlife, and/or environmental quality. The extent to which program action or inaction contributes to that environmental risk establishes the focus for environmental concern. The alternatives analyzed here apply only to the control of bont ticks on St. Croix. Other tick control programs are sufficiently different in their loci and characteristics to be considered separately.

A. No Action

The no action alternative disregards the existing regulatory procedures relating to bont ticks. This alternative provides no mechanism for Federal action against exotic ticks that pose risks to animals or humans of disease, paralysis, or toxicosis. APHIS involvement would be limited to providing technical support and advice. This approach poses a higher risk from bont ticks and their hosts than exists under the present regulations and controls.

Under this alternative, all efforts to detect, quarantine, and control ticks would be restricted to territorial and local governments, commercial entities, and private individuals. The effectiveness of territorial and local government would depend on the personnel and resources that would be available for exotic tick programs. Adequate inspection of imported animals for bont ticks would require greater resources than have been presently designated, and it is uncertain whether the territorial government of St. Croix could afford to increase their efforts to prevent introductions and potential disease. Previous efforts to control ticks by local government, commercial interests, and private individuals have been commensurate with profit motivation and have not been very effective. Past independent initiatives such as the Winchester Quarantine in 1881 stirred up anger and violence among cattle owners, but these efforts were not very effective at controlling

disease and tick spread (Boyd, 2000). Cooperative efforts have yielded better results.

Many of the exotic ticks including tropical bont tick are not host-specific. Therefore, their range could expand through infestation of wild animal populations with potential increase in disease. Bont ticks are known to feed on various wild and domestic ruminants as well as other wildlife. Tick-infested and diseased domestic animals and livestock could be transported through interstate commerce or personal movement to uninfested States and territories where potential loss of agricultural resources and economic costs could be substantial.

The environmental consequences of infestations and disease vectored by ticks are variable. Mortality levels of 40% to 80% to susceptible livestock and wildlife from tropical bont ticks capable of transmitting heartwater and other diseases would result in substantial economic costs and adverse environmental consequences. Based upon the epidemiology of tick-borne disease, the limited success of independent and uncoordinated quarantine efforts, and the inherent ability of the bont ticks to infest, infect, and populate new susceptible hosts, selection of the no action alternative would be expected to result in expansion of the range of bont ticks, commensurate increases in disease incidence, and steadily increasing adverse environmental consequences.

It is anticipated that control of damage from tick infestation would be sought through pesticide applications to treat infested livestock. These treatments would lack the oversight and coordination that Federal programs have. There would be no mandatory requirements for safety procedures as required in Federal programs. The selection of potential pesticide treatments and application rates would not take into account the potential hazards and toxicity. It is anticipated that increased use of pesticides and selection of pesticides with higher toxicity and greater persistence is likely under this alternative because continual reinfestation would be expected and extended protection against the tropical bont tick would be sought by the livestock owners.

B. Quarantine Only

This alternative includes exclusion, surveillance, quarantine, and related efforts to contain and limit the spread of bont ticks and their tick-borne diseases. This could include Federal regulations to restrict importation of

specific hosts known to harbor ticks that cause paralysis, toxicosis, or transmit economically significant foreign animal diseases. It does not include any Federal efforts to treat animals for tick infestation, nor does it include any Federal efforts to treat animal diseases vectored by tropical bont ticks. This regulatory approach to tick problems is not consistent with APHIS' statutory responsibilities and authorities, but it would depend upon territorial, local, commercial, and private interests to control the bont ticks discovered through surveillance and to treat the diseases vectored by these ticks. This alternative assumes timely communication between Federal inspectors and those involved in control and eradication efforts.

This approach has some of the same problems that the no action alternative has. Relegating control efforts to State, local, commercial, and private interests would lack the cooperative advantages of working with a comprehensive Federal program. The limited resources for control under this alternative could limit effectiveness. The dependence upon good communication between certain inspectors conducting surveillance and other individuals involved in control measures would be vital for success of this alternative. The lack of host specificity of these ticks makes it likely that some ticks could move to other hosts on the premises before detection and treatment by the livestock owner were completed. This could be a particular problem if any bont ticks spread to local wildlife. The potential for increases in disease in wildlife and domestic animals would be considerably more likely if an introduction of tropical bont ticks became established.

The addition of quarantine efforts under this alternative helps prevent introduction and movement of exotic ticks, in that exterior quarantines restrict importation of animals that are capable of carrying bont ticks and interstate quarantines prevent spread of exotic ticks from locations that have specific infestations determined through surveillance efforts. Populations of bont ticks on hosts in favorable climates are not likely to be controlled through attrition, but would be expected to maintain increasing numbers. In the absence of control measures, these ticks would become increasingly burdensome to their hosts and increasingly more likely to spread to hosts in adjacent areas. These conditions would not be acceptable to livestock owners who would be anticipated to treat their herds with pesticides in a manner like under the no action alternative. Their continuing need to treat would require greater use of pesticide than under a control program coordinated through Federal efforts. The increased risks of disease from tropical bont ticks are not as great as under the no action alternative, but

those risks are greater than occur from a cooperative quarantine and control alternative.

C. Quarantine and Control

The quarantine and control alternative allows APHIS to cooperate with the territorial and local governments in a program to exclude, detect, delimit, prevent the spread of, and control tick vectors of disease. The imposition of exterior and interstate quarantines could be applied to importation and movement of exotic ticks and host animal species. Importation of some host animals at high risk of carrying ticks or serious tick-borne disease could be prohibited entry. The surveillance for exotic tick infestations would include any premises that house imported animals, but would concentrate on those establishments at locations at high risk of tick survival and introduction. In addition to actions under the previously described alternatives, any premises housing animals infested with tropical bont ticks and the infested animals would be treated to eliminate pest and disease risk. The inclusion of control treatments under this alternative allows for more timely elimination of pest and disease risks. Most of the issues of environmental consequence for this alternative will relate to the use of pesticide treatments.

Animals may contract any of various diseases from exotic tick vectors, but with aggressive implementation of this alternative, the potential transfer of disease to animals is expected to be decreased. Should disease be diagnosed in any specific animals, one program option would be to depopulate (cull and destroy) the animals to prevent spread of the disease. This approach could be effective, but disposition of carcasses would be problematic if large herds were infested. The lack of an effective vaccinations available for treating heartwater disease in host animals effectively limits the options to depopulation or permanent quarantine of infected animals at a regulated facility. Although permanent quarantine might be effective for small facilities, it would be difficult to enforce. It could be burdensome for facilities housing large populations of exotic animals. Depopulation would mandate the appropriate disposal of the carcasses of any euthanized animals. Alternative carcass disposal methods include burial, burning, composting, fermentation, and rendering. These methods and their environmental impacts have been described in the draft Veterinary Services Environmental Impact Statement (USDA, APHIS, 1996). The findings related to carcass disposal in that document are incorporated by reference into this EA. Disposal is done in a manner

that destroys the pathogen, eliminates potential spread of disease, and prevents further transmission to susceptible animals. Selection of a specific disposal method is based upon local geography, topography, type of animal and disease, number of carcasses, and available disposal options. Potential impacts related to carcass disposal include odor control, air emissions, and groundwater effects that must be addressed on a site-specific basis.

The control of tropical bont ticks on infested animals and premises requires application of specific pesticides that prevent tick survival, but do not have adverse effects on the host. The pesticide treatments under consideration would involve spray applications of either amitraz or coumaphos for cattle and coumaphos only for horses. The pesticide treatments for sheep and goats would involve applications of zeta-cypermethrin, permethrin or amitraz. The premises treatments would involve applications of cyfluthrin or permethrin to the grounds and bedding areas. The potential environmental consequences of the treatment of pasture grounds and bedding areas are presented in the risk assessment under the preferred alternative. Cyfluthrin and permethrin are synthetic pyrethroid acaricides, amitraz is a diamidide acaricide, and coumaphos is an organophosphate acaricide. These applications are effective against the exotic ticks known to vector the African heartwater disease organism. These pesticides were selected based upon confirmed good control of exotic ticks at application rates that are not toxic to the host animals being treated.

The application method for each pesticide to infested animals depends upon the chemical and the animal being treated. Amitraz is applied by direct spraying or from a spray-dip machine. Coumaphos in this program may be applied as an emulsifiable concentrate spray. Cyfluthrin and permethrin may be applied by low pressure hand sprayers as aerosols, wettable powders or pour-on liquids to specific parts of the animals. These applications ensure control of the ticks without adversely affecting the host animal. The toxicity of these compounds to species other than invertebrates is slight to moderate. Exposure from treatment of infested hosts is expected to affect only target ticks and any other invertebrates that feed on the hosts. This topic is discussed further under consequences for the preferred alternative.

The goal of this alternative is control of tropical bont tick to prevent disease in livestock. This approach does not ensure that tropical bont tick is eliminated from St. Croix and could involve an ongoing low level of

infestation. The disadvantage of this alternative is that the need to treat animals and premises for bont tick control could be an ongoing program with continuing adverse effects to nontarget wildlife and livestock from spread of tropical bont tick and continuing adverse effects from ongoing pesticide applications. This control approach by the program would not be as effective as an eradication approach would be at eliminating disease and pest risk. Likewise, the environmental consequences would be greater under this alternative than under the quarantine and eradication alternative because this alternative would most likely involve ongoing pesticide applications rather than elimination of the need to treat.

D. Quarantine and Eradication (Preferred Alternative)

The quarantine and eradication alternative allows APHIS to cooperate with the territorial and local governments in a comprehensive program to exclude, detect, delimit, prevent the spread of, and eradicate tropical bont tick vectors of disease. The imposition of exterior and interstate quarantines would be applied to importation and movement of exotic ticks and host animal species. Importation of some host animals at high risk of carrying ticks or serious tick-borne disease would be prohibited entry. The surveillance for exotic ticks would include any premises that house imported animals. As with the control alternative, any premises housing animals infested with tropical bont ticks and the infested animals would be treated to eliminate pest and disease risk. The inclusion of eradication efforts and treatments under this alternative allows for more timely elimination of pest and disease risks. Most of the discussion of environmental consequences for this alternative will relate to these pesticide treatments.

The discussion about depopulation, carcass disposal methods, and quarantine methods described under the control alternative is also applicable to the preferred alternative. The elimination of tropical bont tick as a vector through eradication decreases the potential need for employment of these disease-containment techniques that are very time- and labor-intensive.

1. Animal Treatment Risk Assessment

The pesticides and methods of application used in eradication are the same as in control efforts against tropical bont ticks. The treatment of infested animals with coumaphos, zeta-cypermethrin, permethrin or amitraz would be done to prevent tick survival and lower the risk of contracting heartwater disease. Coumaphos applications are restricted to cattle and horses.

Amitraz may also be used to treat cattle. Amitraz and the other two acaricides may be used to treat other infested ruminants such as sheep and goats. Basic discussion of this treatment method is provided in the previous section. This section will summarize environmental fate and toxicity information about these animal treatment acaricides.

The environmental fate of treatment chemicals applied to livestock is limited to residues on the treated animals and any pesticide that drifts or runs from the site of application. Permethrin and zeta-cypermethrin are synthetic pyrethroids that may volatilize to the air, but are more likely to adsorb to organic matter. The half-life of permethrin in organic soil ranges from 21 to 65 days (Kaufman et al., 1977). The half-life of zeta-cypermethrin in aerobic soil ranges from 1 to 3 weeks (EPA, 1989). Coumaphos is an organophosphate acaricide that adsorbs readily to organic matter and has a half-life in silt loam soil of 185 days (EPA, 1992). Amitraz is a diamidide acaricide that has a soil half-life of 3 to 26 days (EPA, OPTS, 1987). All four acaricides have low mobility in soil, and leaching is unlikely. Coumaphos has a residual action on livestock of 2 to 3 weeks after treatment (Harding, 1979). Coumaphos has very low water solubility, but has been shown to bioaccumulate in fish (EPA, 1992). Amitraz is not readily absorbed in animal tissues and is excreted readily in urine (EPA, OPTS, 1987). The insoluble nature of amitraz in water and rapid excretion result in rapid settling in bottom sediments and no bioaccumulation. Both synthetic pyrethroids have been shown to accumulate in aquatic sediments and bioaccumulate in fish (Heimbach et al., 1992; Schimmel et al., 1983). However, the application directly to animals makes it unlikely that much if any residue from animal treatment would enter surface waters. Runoff and drift are also minimal from direct animal treatments.

Coumaphos is of moderate to severe acute oral toxicity to mammals. Permethrin is of slight acute oral toxicity to mammals, and zeta-cypermethrin is of moderate acute oral toxicity to mammals. Amitraz is of slight to moderate acute oral toxicity to mammals. The mode of toxic action of coumaphos occurs primarily through acetylcholinesterase (AChE) inhibition (Smith, 1987; Klaassen et al., 1986). Signs and symptoms of AChE inhibition at low doses include localized effects (such as blurred vision and bronchial constriction) and systemic effects (such as nausea, sweating, dizziness, and muscular weakness). The mode of toxic action of amitraz to vertebrates is through local anaesthetic action of the compound. The effects of high exposures may include hypersensitivity, restlessness,

tremors, labored breathing, convulsive episodes, cardiovascular collapse, and respiratory block (Chessin and DeWoskin, 1988). The mode of toxic action of synthetic pyrethroids occurs through effects on the sodium channel to stimulate nerves to produce repetitive discharges until the response is blocked (Walker and Keith, 1992). The symptoms of acute toxicity to synthetic pyrethroids in mammals are diarrhea, deepened respiration, tremors, and convulsions. Permethrin and zeta-cypermethrin can produce mild, localized skin irritation, but are not skin sensitizers. Neither amitraz nor coumaphos is classified as a skin irritant or sensitizer (EPA, OPTS, 1987; EPA, 2000).

Chronic feeding and oncogenicity studies indicate that zeta-cypermethrin is not an oncogen (National Research Council of Canada, 1986). Permethrin is suspected of having weak carcinogenic effects (Gosselin et al., 1984; Hallenbeck and Cunningham-Burns, 1985). Coumaphos was negative for oncogenic effects in a 2-year feeding study of rats (NCI, 1979). A 2-year rat feeding study of amitraz was negative for oncogenicity at 200 ppm, but a 2-year study of mice at 400 ppm demonstrated an increase in lymphoeticular tumors in female mice. Based upon these studies, EPA (OPTS, 1987) has classified amitraz as a borderline C/D carcinogen. No positive results were found in mutagenic tests conducted with amitraz, coumaphos, permethrin or zeta-cypermethrin (EPA, 1985; National Research Council of Canada, 1986; EPA, OPTS, 1987). Reproductive and developmental effects from these compounds occur only at exposures much higher than would be anticipated in the tropical bont tick program.

The human health risk characterization indicates that the highest potential exposures occur to program workers in accidents where a worker receives direct exposure from a spill or broken hose. Immediate cleansing of the exposed skin and other required safety procedures lower these risks to an acceptable level. Applications to treat livestock make public exposure unlikely and pose negligible risks to the general public. Applicator risks are slight for typical exposure scenarios and slight to moderate for extreme exposure scenarios. This assessment does not consider the effect of required safety procedures and protective clothing on the overall exposure. Use of required protective gear and proper adherence to safety procedures ensure that risks to workers are within acceptable limits.

Permethrin is very slightly toxic to birds and zeta-cypermethrin is practically nontoxic to birds (National Research Council of Canada, 1986). Amitraz is very slightly to slightly toxic to birds. Coumaphos is severely toxic to birds.

Amitraz is selectively toxic to certain terrestrial invertebrates. The other three acaricides are moderately to severely toxic to terrestrial invertebrates. All four acaricides are very highly toxic to fish and aquatic invertebrates. The risk to most terrestrial wildlife is low except those insects that feed upon or are attracted to the treated livestock. The risk to aquatic species of fish, aquatic invertebrates, and aquatic amphibians is low from direct treatments of animals. Drift and runoff from animal treatments are not expected to pose noteworthy risks to any wildlife. Some birds such as cattle egrets that feed on ectoparasites could get higher exposures than most wildlife. The low inherent toxicity of amitraz, permethrin, and zeta-cypermethrin to birds would preclude any adverse effects from their exposure. Effects from the limited exposure of birds to coumaphos are not expected to include any signs of direct toxicity.

2. Premises Treatment Risk Assessment

The applications of cyfluthrin and permethrin to premises would help to eliminate ticks from potential bedding locations and other areas that could harbor populations of immature and adult ticks. A chemical risk assessment (USDA, APHIS, 2000) was prepared to analyze the environmental impacts of premises treatment thoroughly. The results of that risk assessment are summarized briefly in this EA; the findings of the assessment are incorporated by reference.

The environmental fate of treatment chemicals is an important consideration for premises treatments. Cyfluthrin and permethrin are synthetic pyrethroids that may volatilize to the air, but are more likely to adsorb to organic matter. Their half-life in organic soil ranges from 21 to 65 days (EPA, 1987; Kaufman et al., 1977). Neither compound is considered to be mobile in soil. Both compounds have been shown to accumulate in aquatic sediments and bioaccumulate in fish (Heimbach et al., 1992; EPA, 1987; Schimmel et al., 1983). The half-life of cyfluthrin in fish is about 9 days (EPA, 1991). Residues in fish decrease rapidly in untreated waters. Runoff and drift of cyfluthrin and permethrin into bodies of water should be avoided.

Cyfluthrin is of moderate acute oral toxicity to mammals, and permethrin is of slight acute oral toxicity to mammals. The mode of toxic action of synthetic pyrethroids occurs through effects on the sodium channel to stimulate nerves to produce repetitive discharges. Muscle contractions are sustained until there is a block of the contraction. Nerve paralysis occurs at high levels of exposure (Walker and Keith, 1992). The symptoms of pyrethroid toxicity in mammals are diarrhea, deepened respiration, tremors, and convulsions. Both compounds can produce mild, localized skin

irritation, but neither compound is a skin sensitizer. Chronic feeding and oncogenicity studies indicate that cyfluthrin is not an oncogen (EPA, 1987), but permethrin is suspected of having weak carcinogenic effects (Gosselin et al., 1984; Hallenbeck and Cunningham-Burns, 1985). No positive results were found in mutagenic tests conducted with cyfluthrin and permethrin (EPA, 1987; National Research Council of Canada, 1986). Reproductive and developmental effects from these compounds occur only at exposures much higher than would be anticipated in the tick programs.

The human health risk characterization indicates that the highest potential exposures occur to program workers in accidents where a worker receives direct exposure from a spill or broken hose. Immediate cleansing of the exposed skin and other required safety procedures lower these risks to an acceptable level. All potential exposures of the public pose negligible risks. Ground applicator risks are slight for typical exposure scenarios and slight to moderate for extreme exposure scenarios. The analysis of these scenarios does not consider the effect of required safety procedures and protective clothing on the overall exposure. Use of required protective gear and proper adherence to safety procedures ensure that risks to workers are within acceptable limits.

Cyfluthrin is practically nontoxic to birds, and permethrin is very slightly toxic to birds. Both pesticides are moderately to severely toxic to terrestrial invertebrates, and very highly toxic to fish and aquatic invertebrates. The nontarget wildlife risk characterization considers the potential exposure from direct application, off-site drift, and runoff. The risk to most terrestrial wildlife is low, except to insects which are more susceptible. Insects present on treated premises can be expected to have high mortality. The risk to aquatic species of fish, aquatic invertebrates, and aquatic amphibians is high in ponds with no buffer and moderate to high in streams (flowing water). Adherence to a 25-foot buffer around bodies of water places these species at low risk. This buffer should be considered for treatment of those few premises where standing water is an issue.

3. Environmental Justice

Consistent with Executive Order 12898, "Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations," APHIS considered the potential for disproportionately high and adverse human health effects on any minority populations and low-income populations. Ongoing regulation of the import of animals potentially infested with exotic ticks is an activity most likely to affect zoos, pet suppliers, and facilities involved in rearing and maintaining live animals of

foreign origin. These regulations do not specifically affect any subgroup of the population, and the cost of these imported species is likely to exceed what low-income populations could afford. The nature of all proposed regulatory and eradication actions does not affect any specific subgroups of the population differently from others. Therefore, no disproportionate effects on minority or low-income populations are anticipated as a consequence of implementing the preferred action.

4. Endangered and Threatened Species

The Endangered Species Act of 1973 (ESA) as amended (16 U.S.C. 1531 *et seq*.) requires all Federal departments and agencies to consult with the U.S. Department of the Interior's Fish and Wildlife Service (FWS) and/or the U.S. Department of Commerce's National Marine Fisheries Service (NMFS) to ensure that any action that they authorize, fund, or carry out is not likely to jeopardize the continued existence of an endangered or threatened species or result in the destruction or adverse modification of its critical habitat (16 U.S.C. 1536(a)(2)). The livestock and any animals associated with the livestock (i.e., egrets) are not endangered or threatened species and are not adversely affected by the tick treatments. The present premises treatment is limited to an abandoned golf course. This man-made habitat is not home to, or the habitat for, any endangered or threatened species of plants or animals. However, possible expansion of the present infestation could potentially include habitats for these species. APHIS will consult with FWS and/or NMFS, as appropriate, for locations requiring pesticide treatments to ensure that no effects occur to endangered or threatened wildlife. APHIS will comply with all protective measures stipulated in that consultation and mutually agreed on with FWS and/or NMFS.

5. Protection of Children

Consideration was also given to compliance issues related to Executive Order 13045, "Protection of Children From Environmental Health Risks and Safety Risks." Based upon review of the sites of premises most likely to be treated and the results of the chemical risk assessment (USDA, APHIS, 2000), it was determined that this program does not pose any disproportionately high environmental health risks or safety risks to children because the potential premises to be treated are at sites not frequented by children, and the risks of adverse effects to anyone visiting such sites are negligible at times other than during treatments when access would be restricted to workers.

IV. Agencies, Organizations, and Individuals Consulted

U.S. Department of Agriculture
Animal and Plant Health Inspection Service
International Programs
4700 River Road, Unit 67
Riverdale, MD 20737-1233

U.S. Department of Agriculture
Animal and Plant Health Inspection Service
Policy and Program Development
Environmental Analysis and Documentation
4700 River Road, Unit 149
Riverdale, MD 20737-1238

U.S. Department of Agriculture
Animal and Plant Health Inspection Service
Veterinary Services
4700 River Road, Unit 41
Riverdale, MD 20737-1231

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Finding of No Significant Impact
for
St. Croix Cooperative Bont Tick Eradication Program
Environmental Assessment, September 2001

The U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), has prepared an environmental assessment (EA) that analyzes alternatives for a proposed cooperative bont tick program. Bont ticks are vectors of diseases (viral and bacterial) that may result in injuries and death to both domestic and wild animals. The EA, incorporated by reference in this document, is available from:

U.S. Department of Agriculture
Animal and Plant Health Inspection Service
Veterinary Services
4700 River Road, Unit 41
Riverdale, MD 20737-1231

The EA is available for public inspection at USDA, Room 1141, South Building, 14th Street and Independence Avenue, SW, Washington, DC, between 8:00 a.m. and 4:30 p.m., Monday through Friday, except holidays. Persons wishing to inspect the EA are requested to call ahead on 202-690-2817 to facilitate entry into the reading room.

The EA for this program analyzed alternatives of (1) quarantine and eradication (the preferred alternative), (2) quarantine and control, (3) quarantine only, and (4) no action. All of the alternatives were determined to have potential environmental consequences. APHIS selected the quarantine and eradication alternative because of its greater effectiveness in reducing the potential for tick-borne disease of animals and humans. Only minimal and manageable adverse impacts are anticipated to human health, nontarget species, and the physical environment from the proposed eradication methods. Protection measures will be applied as required for the protection of endangered and threatened species.

I find that implementation of the proposed program will not significantly impact the quality of the human environment. I have considered and based my finding of no significant impact on the risk assessment prepared for the EA and on my review of the program's operational characteristics. In addition, I find that the environmental process undertaken for this program is entirely consistent with the principles of "environmental justice," as expressed in Executive Order 12898. Lastly, because I have not found evidence of significant environmental impact associated with this proposed program, I further find that no additional environmental documentation need be prepared and that the program may proceed.

/s/ 10/19/01

Dr. Alfonso Torres
Deputy Administrator
Veterinary Services

Date